

# Ipswich River Restoration: LID Demonstration Projects

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Northeast CZM Partners Workshop

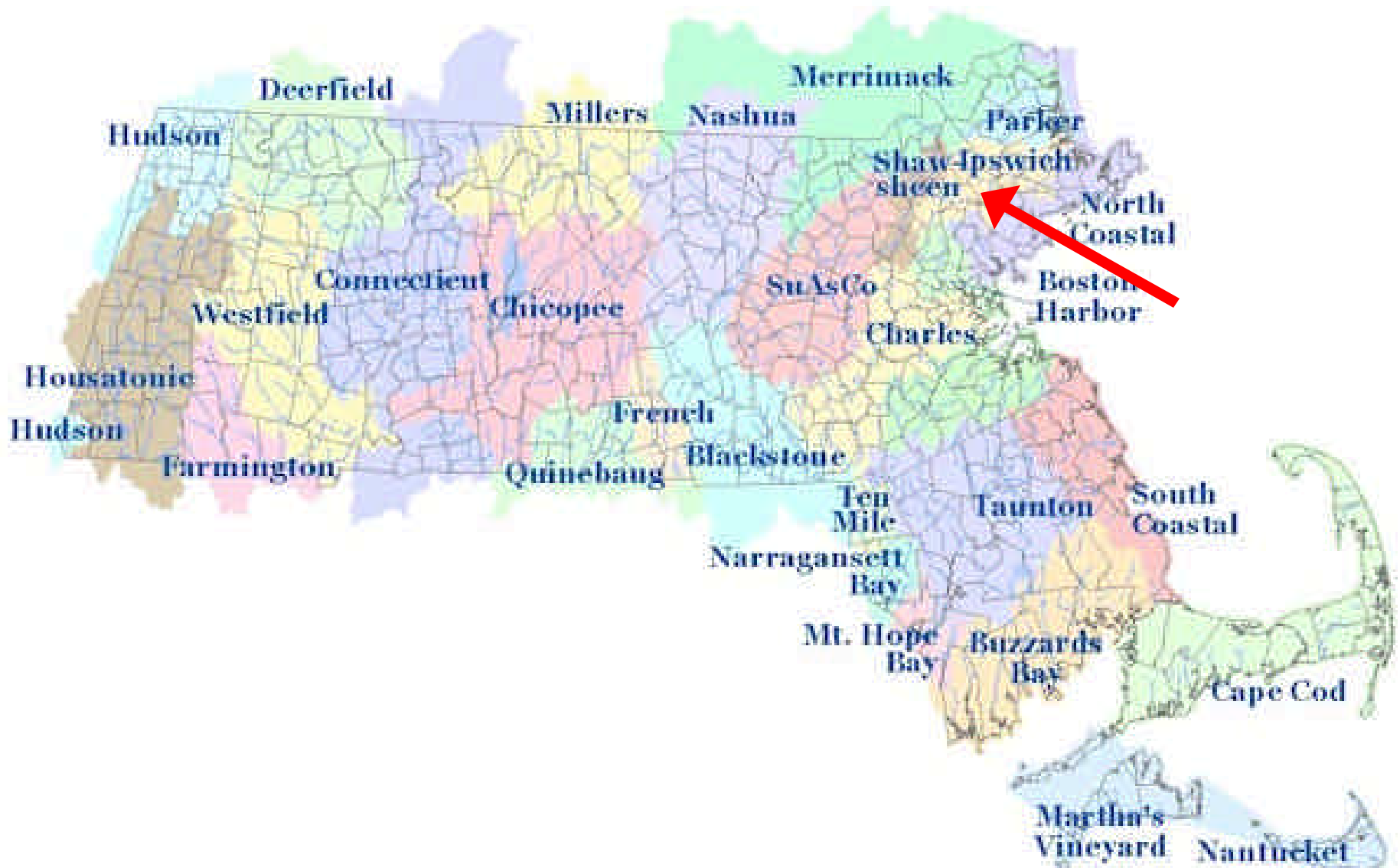
October 5, 2005



# Overview

- The Problem: No Flows and Low Flows
- The Solution: Targeted Watersheds Demonstration Projects
- LID Subdivision and Green Roof: Lessons Learned from Implementation

# Massachusetts Watersheds







1995

1997



# 1999



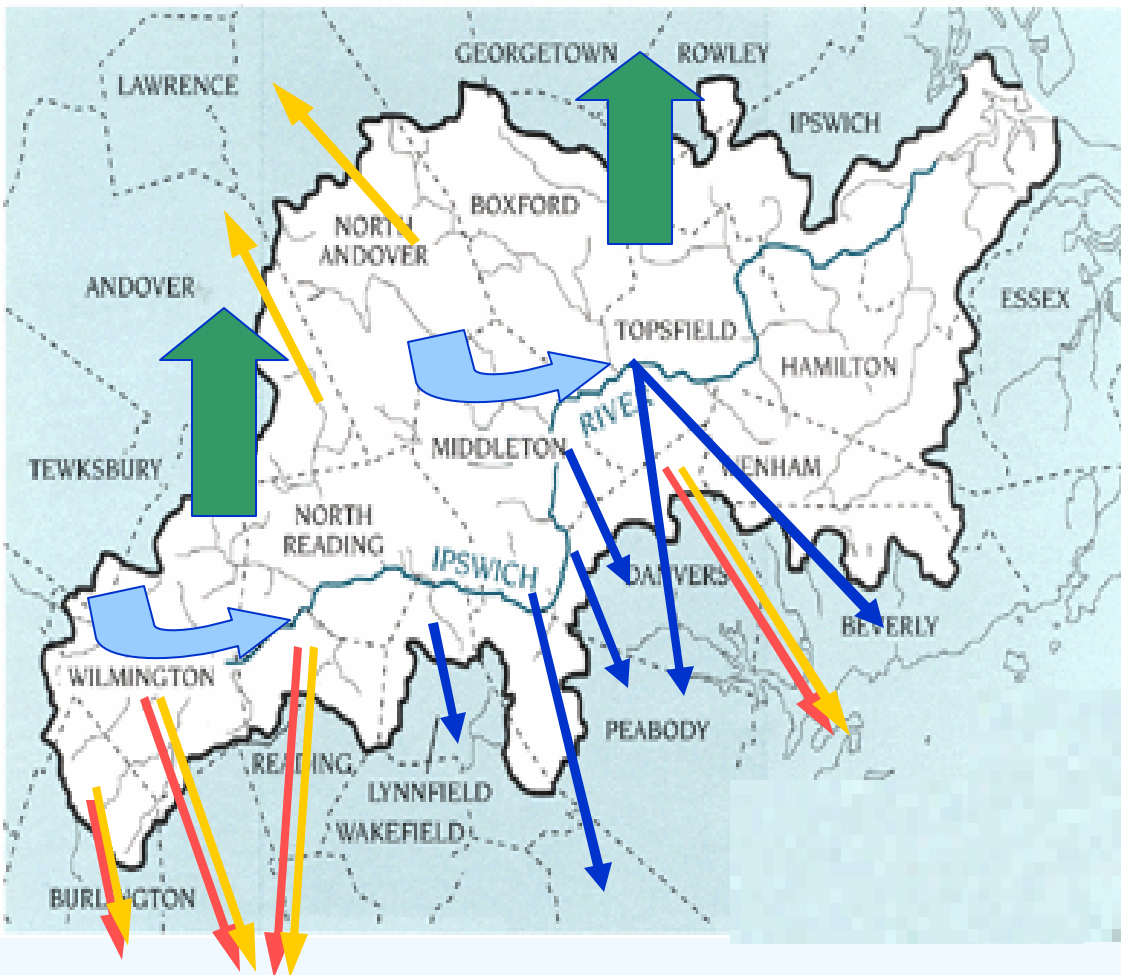
2002



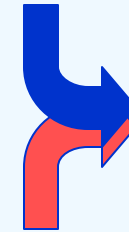


2005





## - Export of water for water supply



**80% of all  
withdrawals  
(24 MGD)**

## - Export of wastewater

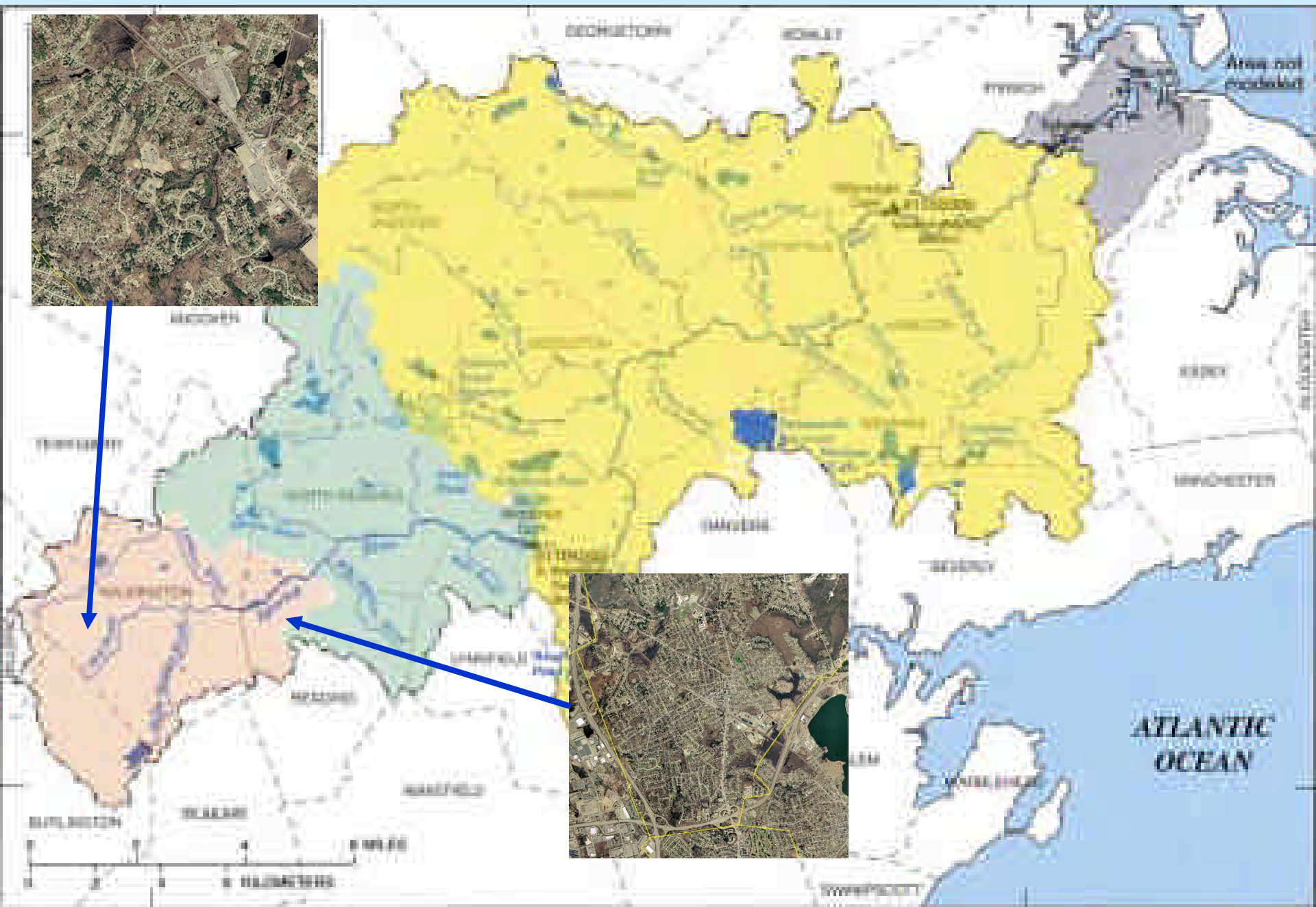
- Inflow and Infiltration (55-65% of pipe flow)

- Increased Loss to Runoff

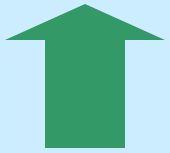
## - Loss to Lawn Irrigation

# 14.4 MGD Deficit (5 MGD Upper Basin)

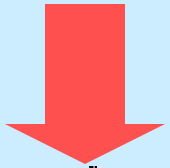




# EPA Targeted Watersheds Grant



Increase Stormwater Recharge - 5 Low-Impact Development (LID) Demonstration Projects



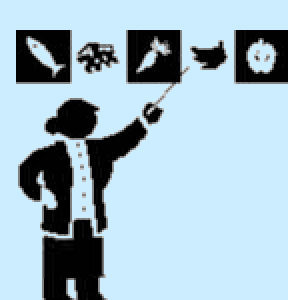
Decrease Water Demand - 4 Water Conservation Demonstration Projects



Quantify Impact to Water Quantity and/or Quality



Model Theoretical Impact of Watershed-wide Application of Techniques



Educate Stakeholders and Public on Demonstration Projects and Research Findings

# 1. LID Subdivision

Conventional  
Development



LID Subdivision



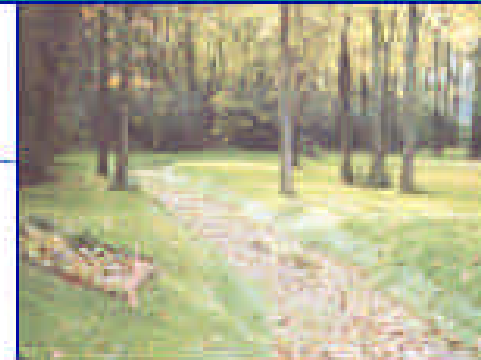
## 2. Green Roof



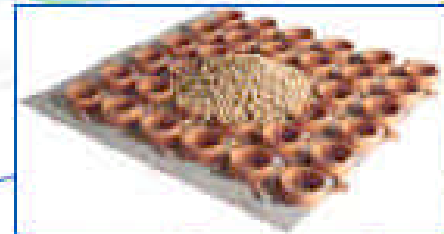
### 3. Porous Pavement Parking Lot



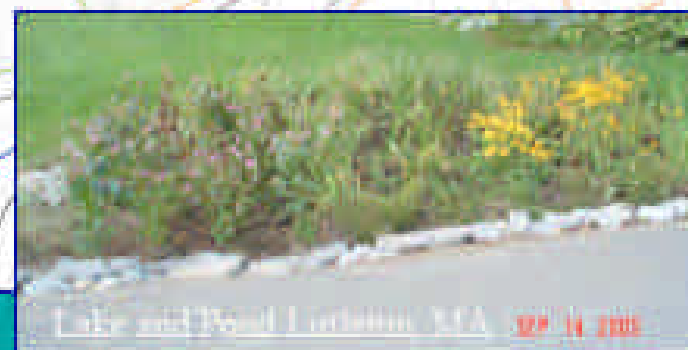
## Vegetated Water Quality Swales



GravelPave



## Raingarden





# 4. Lake Remediation: LID Streetscape Retrofit







# 5. Rainwater Harvesting





# Large Rainwater Harvesting System





# Water Conservation Demonstration Projects

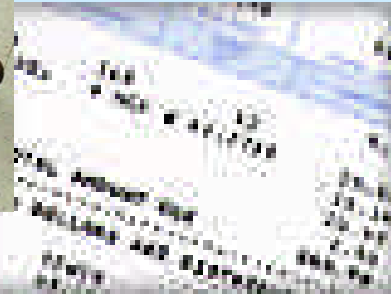
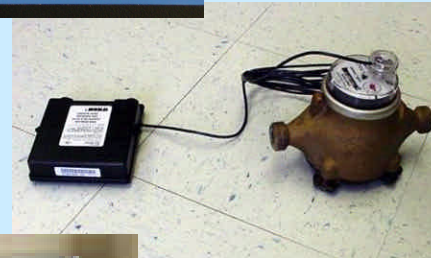
6. LID Ball Field

7. Irrigation Control  
Switch

8. Meter Replacement  
& Monthly Billing

9. Home Rebate &  
Retrofit Program

10. (Rainwater Harvesting)



# **LID Subdivision Demonstration:**

## *Implementation Challenges*

- **Project Requirements:**
  - Located in Ipswich watershed
  - Design based on LID principles
  - Construct by June 2007
  - Funding & financing in place
- **Scope:**
  - Build it
  - Cooperate on monitoring & demonstration
- **Funding: \$90,000**

# LID Subdivision Demonstration

- Results:
  - 2 solicitation rounds
  - 3 applications

March 2005						
Previous Month						Next Month
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
February 27	28	March 1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	April 1	2

September 2005						
Previous Month						Next Month
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
August 28	29	30	31	September 1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	October 1

June 2007						
Previous Month						Next Month
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
May 27	28	29	30	31	June 1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
July 1	2	3	4	5	6	7

# **1. What IS LID?**

*Will I know it when I see it?*

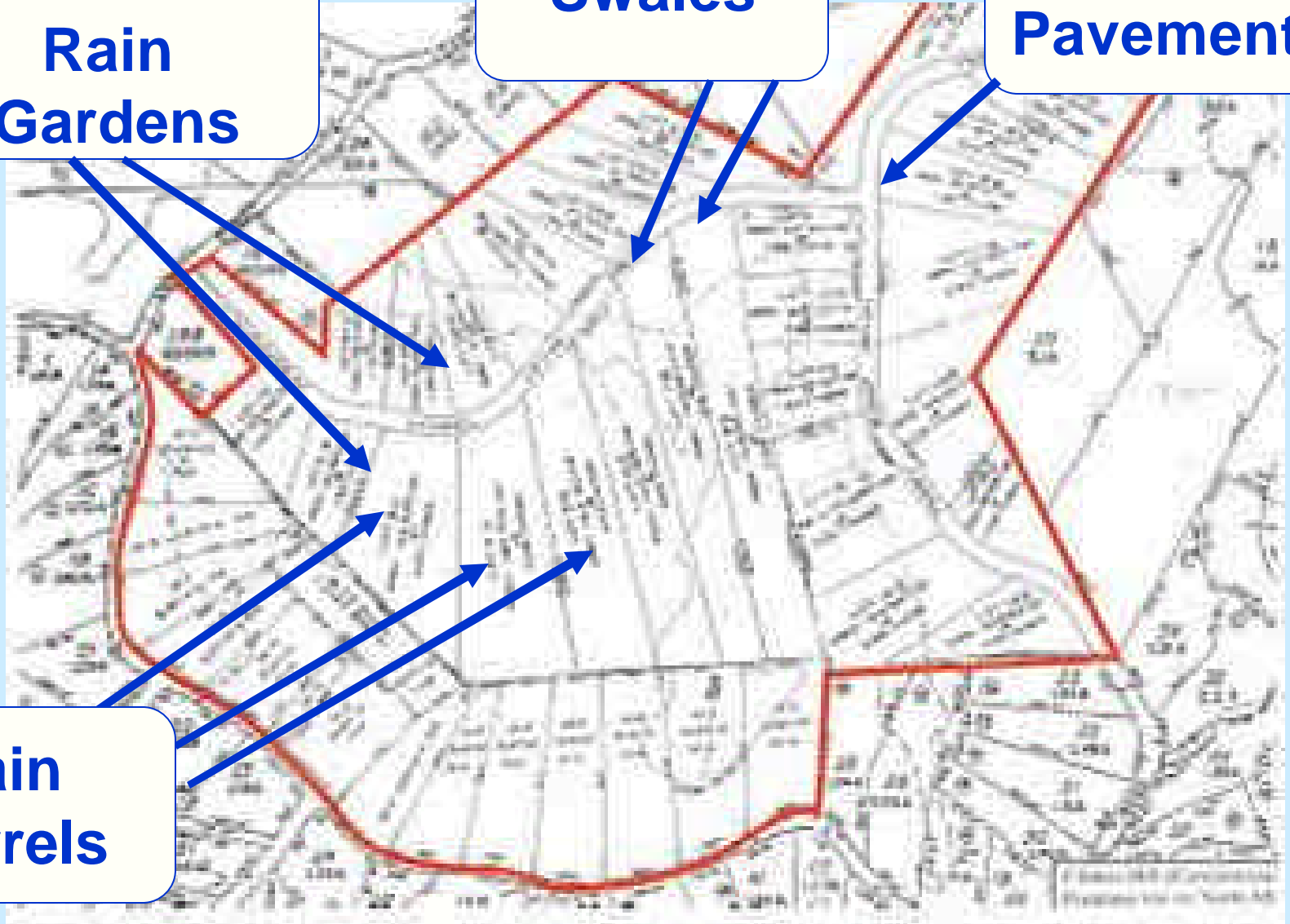


**Bioretention/  
Rain  
Gardens**

**Swales**

**Porous  
Pavement**

**Rain  
Barrels**



**2a. “In an LID project, the developer has to request waivers from everything.”**

*- Planning Board Chair*

**2b. “I will not entertain a special permit process.”**

*- Developer*

# Reduce Roadway Widths; Eliminate Curbs

Standard



LID



# Shared Driveways





# Centralized Collection vs. Distributed Vegetated Areas

Standard



LID



**3. “Low impact to the environment generally means high impact to me.”**

*- DPW Director*

“We know how to  
maintain this...”



...But not this”



**4. “The costs to the town of  
planning, reviewing,  
monitoring...are significant.”**

*- Planning Board Chair*



# **Green Roof Demonstration:**

## *Implementation Challenges*

- Huge educational challenge
  - “OK. I give up. What’s a green roof?”
  - “Will it fall in on the kids?”
  - “Won’t it leak?”
  - “What about snow load?”
  - “But has it been done HERE before?”



***Putney School, VT***

# Lessons

1. Educate, educate, educate
2. Need data to challenge the accepted wisdom
3. Value of demonstration projects
4. Adopt LID by-law or regulations
  - Define LID
  - Can include fees for reviews
  - Shift maintenance responsibilities to property owner

# The Alternative?



# Contacts

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## **U.S. Environmental Protection Agency**

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